Docket No.: 043888-0267

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
Tsutomu OHZUKU, et al.	:	Confirmation Number: 9492
Application No.: 10/629,815	:	Group Art Unit: 1795
Filed: July 30, 2003	:	Examiner: LEE, Cynthia K.

For: POSITIVE ELECTRODE ACTIVE MATERIAL AND NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY CONTAINING THE SAME

Declaration Under 37 C.F.R. § 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Dr. Hiroshi Yoshizawa, declare as follows:

1. I received a doctorate of Engineering from the Graduate School of Engineering, Osaka City University.

2. My field of specialty is lithium ion secondary batteries.

3. Since 1987, I have been employed by Panasonic Corporation.

4. I have been working in the field of research and development of lithium ion secondary batteries for the past 13 years.

5. I am a coinventor of U.S. Patent Application Serial No. 10/629,815, POSITIVE ELECTRODE ACTIVE MATERIAL AND NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY CONTAINING THE SAME, filed July 30, 2003 (the present invention).

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6. I have read and am familiar with the disclosure of the above-captioned patent application. I have read and am familiar with Ohzuku et al., *Layered Lithium Insertion Material of $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ for Lithium-Ion Batteries* (Chemistry Letters, CL-010390, Vol. 30 (2001), No. 7, pp. 642-43) and Ohzuku et al., *Layered Lithium Insertion Material of $LiN_{1/2}Mn_{1/2}O_2$ for Lithium-Ion Batteries: a Possible Alternative to $LiCoO_2$ for Advanced Lithium-Ion Batteries* (Chemistry Letters, CL-010410, Vol. 30 (2001), No. 8, pp. 744-45).

7. At my direction and under my supervision positive active electrode material according to Example 1-2 of the present invention was fabricated.

8. At my direction and under my supervision positive active electrode material according to *Layered Lithium Insertion Material of $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ for Lithium-Ion Batteries* (Chemistry Letters, CL-010390) was fabricated from $LiOH{\cdot}H_2O$, $CoCO_3$, and nickel manganese hydroxide in the manner described on page 642, left column, 17th line from the bottom, et seq.

9. The positive active electrode material fabricated according to the present invention and the positive electrode active material fabricated according to Chemistry Letter, CL-010390 were analyzed by Electron Probe Micro Analysis (EPMA) using a JEOL Ltd. JXA-8900, under the following conditions:

Temperature:	Room Temperature
Irradiation Current:	5×10^{-8} A
Acceleration Voltage:	15 kV
Range of Analysis:	

(x-direction) 0.2 μm × 340 points = 68 μm
(y-direction) 0.2 μm × 255 points = 51 μm.

10. The distribution of cobalt in the Chemistry Letters, CL-010390 material is shown in Exhibit A in the micrograph labeled "prior art" and the cobalt distribution in the material according to the present invention is shown in the micrograph labeled "our invention."

11. Green represents a low concentration, red represents a high concentration, and yellow represents an intermediate concentration, for each of Ni, Mn, Co. The Co map only shows Co concentration, the Ni map only shows Ni concentration, and the Mn map only shows Mn concentration.

12. Exhibit B illustrates the distribution of cobalt, manganese, and nickel in the material according to the present invention.

13. As illustrated in Exhibit A, positive electrode active material fabricated according to Chemistry Letters, CL-010390 exhibit a non-uniform elemental distribution. Exhibit A, as indicated by the Co-rich and Co-poor areas, clearly shows a widely varying distribution of cobalt in the Chemistry Letters, CL-010390 positive electrode active material. In contrast thereto, Exhibits A and B clearly illustrate that cobalt is uniformly dispersed throughout the positive electrode material according to the present invention.

14. The Examiner's interpretation of the elemental maps in the Office Action mailed July 23, 2009 is incorrect. Even if an active material has a completely uniform composition, the micrograph of the active material will not be substantially monocolor. There are two major reasons why it will not be substantially monocolor.

(a) The first reason is the edge effect. When a cross-section of a spherical particle is seen from one direction, the thickness of the edge of the particle decreases (the thickness of the particle in the cross-section decreases as the distance from the center of the particle increases). Thus, there is a difference in color tone between the edge portion and the central portion of the particle.

(b) The second reason is due to the gray levels of the measuring device. When the gray level is high, a slight measurement error is detected, and the detected error is

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shown as a difference in tone in the resultant micrograph. When a low-resolution measuring device not capable of detecting measurement errors is used to detect a uniform active material, the resulting micrograph will become monocolor. However, when a high-resolution measuring device with a high gray level is used to detect a completely uniform active material, even the central part of the active material particle will not become monocolor.

Uniform dispersal of multiple colors represents uniform elemental distribution.

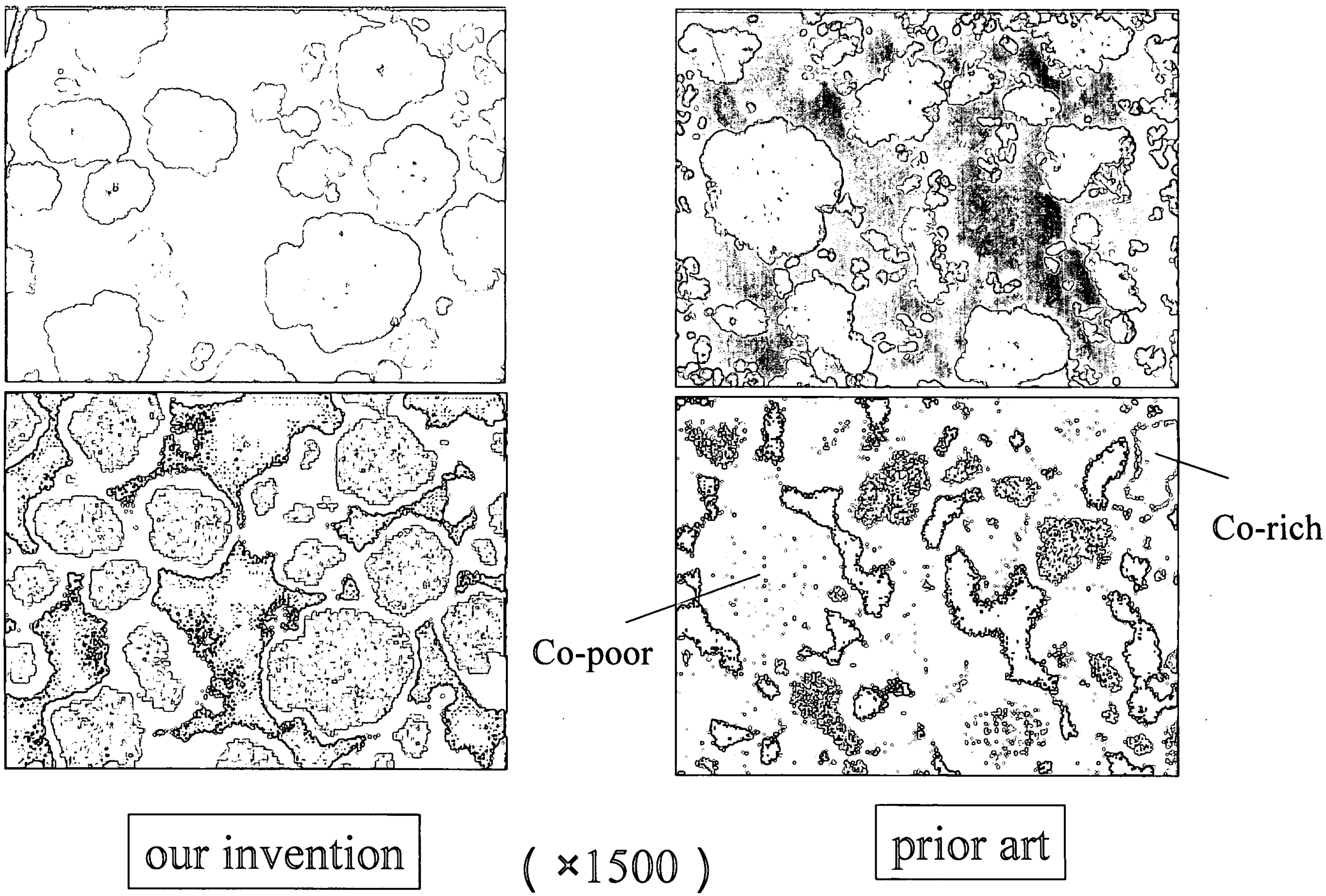
15. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements are made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of this application or any patent issuing therefrom.

November 16, 2009
Date

Hiroshi Yoshizawa
Hiroshi Yoshizawa

A

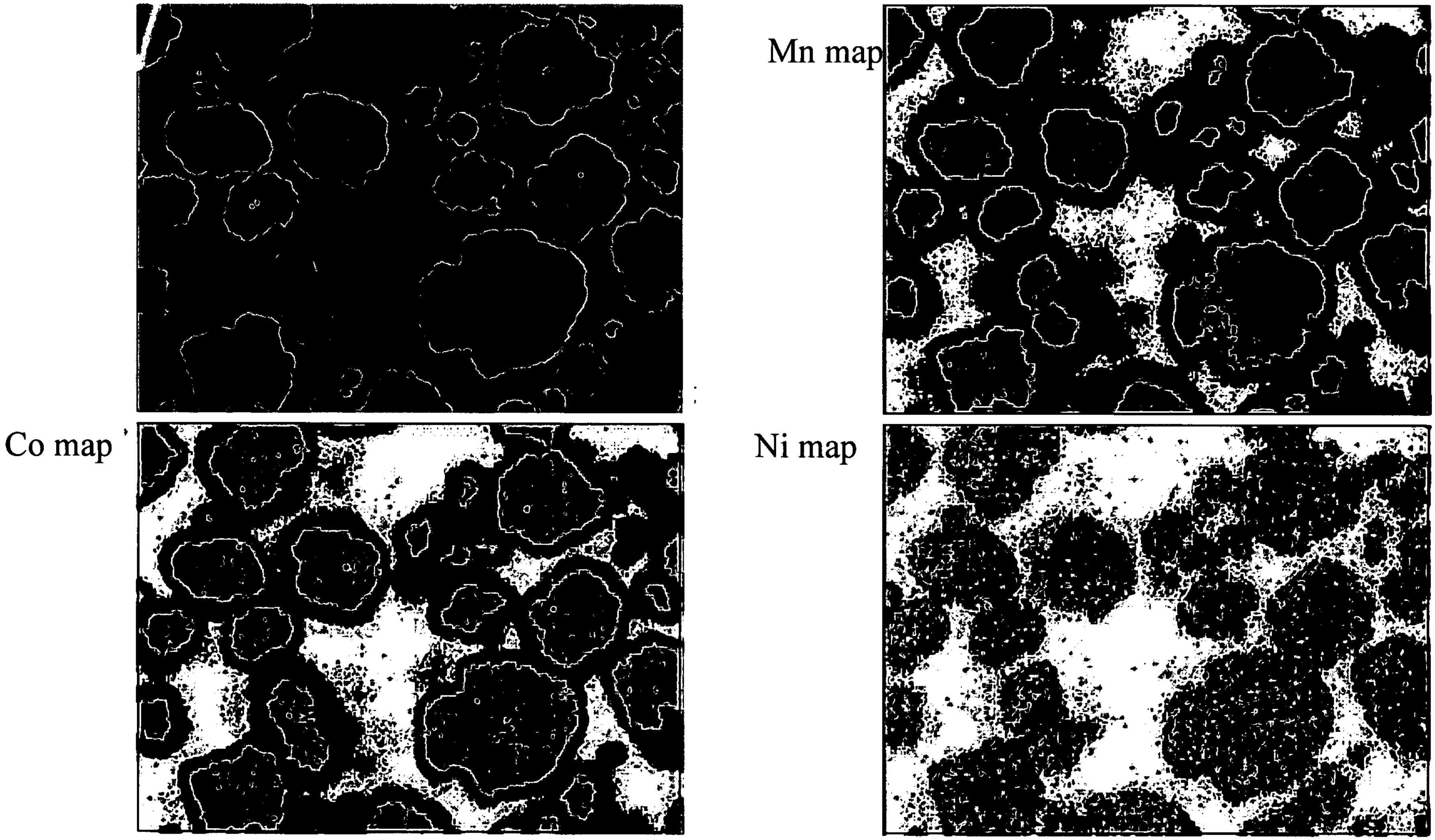
Co map



(×1500)

B

our invention



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